Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Cos-Mar Styrene Monomer Plant
TOTAL PETROCHEMICALS USA, INC.
Carville, Iberville Parish, Louisiana
Agency Interest Number: 1607
Activity Number: PER20070002
Draft Permit 1280-00013-V4

The regulatory basis for the Statement of Basis is found in 40 Code of Federal Regulations (CFR) § 70.7 Permit issuance, renewals, reopenings, and revisions, subsection (a), paragraph (5) and the Louisiana Administrative Code (LAC), Title 33, Part III. AIR. Specifically §531. Public Notice and Affected State Notice, subsection A, paragraph 4. LAC 33:III.531.A.4 states:

> "The permitting authority shall provide a statement that sets forth the legal and factual basis for the proposed permit conditions of any permit issued to a Part 70 source, including references to the applicable statutory or regulatory provisions. The permitting authority shall send this statement to any person who requests it and to EPA."

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I. APPLICANT:

Company:
TOTAL PETROCHEMICALS USA, INC.
P.O. Box 11
Carville, Louisiana 70721-0011

Facility:
Cos-Mar Styrene Monomer Plant
6325 Highway 75, Carville, Iberville Parish, Louisiana
Approximate UTM coordinates are 685.86 kilometers East and 3344.81 kilometers North, Zone 15

II. FACILITY AND CURRENT PERMIT STATUS:

TOTAL PETROCHEMICALS USA, INC. (TOTAL) indirectly owns a partnership interest in Cos-Mar Company (owner of the Cos-Mar Styrene Monomer Plant) and operates the Cos-Mar Styrene Monomer Plant (on behalf of Cos-Mar Company) and the Carville Polystyrene Plant near Carville in Iberville Parish, Louisiana. The Cos-Mar Styrene Monomer Plant has the capacity to produce approximately 2.55 billion pounds of styrene monomer annually and currently operates under Permit No. 1280-00013-V3 issued on April 2, 2007. This permit also includes provisions of the Prevention of Significant Deterioration (PSD) review from Permit No. PSD-LA-690. Boiler HS-1301AR also operates under Permit No. PSD-LA-607 issued on March 17, 1997. The Carville Polystyrene Plant (AI No. 5176) has a rated annual capacity to produce 1.75 billion pounds of polystyrene by the continuous polymerization of styrene monomer and currently operates under Permit No. 1280-00036-V1 issued on December 28, 2006.

This permit addresses the Cos-Mar Styrene Monomer Plant air permitting requirements only.

The Cos-Mar Styrene Monomer Plant produces styrene monomer through the alkylation of benzene and ethylene to ethyl benzene (EB), followed by dehydrogenation of EB to

styrene. Fuels utilized at the facility include natural gas, hydrogen gas from process vents, and process residues, mainly polyethylbenzenes and styrene tar. Finished products, as well as raw materials used as feedstock, are stored in either floating roof storage tanks or fixed roof storage tanks. Marine barges, tanker trucks, and railcars are used to receive raw materials as well as to transport finished products to customers off-site.

The Cos-Mar Styrene Monomer Plant is comprised of EB and Styrene Units and associated equipment for materials storage and wastewater treatment. In the EB Unit, fresh and recycled benzene are preheated prior to being combined with fresh ethylene. This mixture is then fed into an alkylation reactor. Product is transferred to the recovery section of the EB Unit, and the reaction heat is recovered via feed/effluent exchange.

In the product recovery section, the distillation train first removes un-reacted benzene from the reactor effluent and recycles it back to the alkylation reactor, while the non-condensables are burned as fuel. The benzene free product is then separated into an EB final product and a heavier bottoms fraction which is further separated into an alkylaromatics stream and a residue. The alkylaromatics stream is recycled back into the process while the residue is used as an absorption liquid in the Styrene Units or sold as an end product.

In the Styrene Unit, recycled EB and fresh EB are mixed, vaporized, and catalytically dehydrogenated to styrene in the presence of superheated steam. Reaction steam condensate is steam-stripped to recover dissolved volatiles. Styrene monomer is purified in vacuum distillation columns. Benzene and toluene are separated and recovered. Benzene is recycled to the EB Unit while toluene is sold as a co-product. EB is recovered from the styrene monomer in the second column and then recycled. Styrene monomer is further purified in the remaining columns.

Dehydrogenation reactor vent gas, consisting primarily of hydrogen, is sent to the adjacent Air Products facility where the hydrogen is removed. The gas stream is then returned to Cos-Mar and used as additional fuel in the process heaters. When Air Products is not operating, the vent gas is used as fuel in the process heaters.

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Initial/Modification Title V Part 70 permits that were issued by the Department of Environmental Quality (the Department) to TOTAL include:

Permit #	Units or Sources	Date Issued
1280-00013-V3	Cos-Mar Styrene Monomer Plant	4-02-2007
1280-00036-V1	Carville Polystyrene Plant (AI # 5176)	12-28-2006

Initial/Renewal/Modification Title V Part 70 permits that are under review by the Department include:

Permit #	Units or Sources	Date Issued
< none >		

III. PROPOSED PERMIT / PROJECT INFORMATION:

Proposed Permit

TOTAL submitted an application and Emission Inventory Questionnaire (EIQ) dated April 16, 2007 requesting a minor modification to Part 70 Operating Permit 1280-00013-V3.

A notice requesting public comment on the permit will be published in *The Advocate*, Baton Rouge, Louisiana on XXXXX, 2007 and in *The Post/South*, Plaquemine, Louisiana on XXXXX, 2007. A copy of the public notice will be mailed to concerned citizens listed in the Office of Environmental Services Public Notice Mailing List on XXXXX, 2007. All comments will be considered prior to the final permit decision.

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Project description

In this Part 70 operating permit minor modification, TOTAL requested the following changes:

1. To re-instate the following boilers (at the original permitted rates) into its current Title V permit:

    a. HS-1301B H.P. (High Pressure) Boiler (Source ID No. 145-02-E)
    b. HS-301A M.P. (Medium Pressure) Boiler (Source ID No. 145-02-K)
    c. HS-301C M.P. (Medium Pressure) Boiler (Source ID No. 145-02-M)
    d. HS-301D M.P. (Medium Pressure) Boiler (Source ID No. 145-02-N)

    A significant portion of the steam required to operate the Cos-Mar Styrene Monomer Plant is purchased from an adjacent industrial plant, the Calpine Carville Energy Center (Carville Energy). Carville Energy has notified TOTAL that, effective July 1, 2007, Carville Energy may not run the Calpine Carville Energy Center on a full-time basis, which as a practical matter may result in the Calpine Carville Energy Center's inability to meet the full steam needs of Cos-Mar Company. In order to operate both the Cos-Mar Styrene Monomer Plant and the Carville Polystyrene Plant at normal rates, it will be necessary for TOTAL to utilize the steam capacity of all of the boilers at the plant site including those previously removed in Permit No. 1280-00013-V2 dated March 20, 2006 as part of a permit modification to construct, install, and operate a new high pressure boiler, HS-1301BR Boiler (Source ID No. 145-05-Q).

    The above boilers have never been permanently shutdown; there will be no change in the method of operations.

2. To extend the construction phase of the installation of HS-1301BR Boiler (Source ID No. 145-05-Q) to allow for the delivery and installation of a Selective Catalytic Reduction (SCR) unit. In the SCR Unit, ammonia will be injected into the hot exhaust stream of the boiler, prior to the catalyst bed, for reduction of nitrogen oxides (NO_x) on the catalyst surface to nitrogen and water; unreacted NO_x, unreacted ammonia, and ammonia from ammonia slip will also be present in the effluent gas.

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Ammonia is a Class III Louisiana toxic air pollutant (TAP) pursuant to LAC 33:III.Chapter 51 and does not require control technology. HS-1301BR was originally permitted with a vendor guarantee of 0.27 lbs of NO_x/MMBTU emission limit. The SCR unit will be used to reduce NO_x emissions to 0.2 lbs of NO_x/MMBTU emission limit. The anticipated start-up of HS-1301BR is tentatively scheduled for the second quarter of 2007. Prior to the installation of the SCR unit, compliance with the 0.2 lbs of NO_x/MMBTU emission limit will be demonstrated by using the NO_x CEMS performance evaluation in addition to the monitoring, recordkeeping, and reporting requirements of 40 CFR 60 Subpart Db (Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units).

Permitted Air Emissions

Estimated emissions in tons per year (TPY) for the Cos-Mar Styrene Monomer Plant are as follows:

Pollutant	Before	After	Change
PM_{10}	335.09	363.60	+ 28.51
SO_2	10.88	16.29	+ 5.41
NO_X	663.50	1,066.32	+ 402.82
CO	674.76	938.36	+ 263.60
Total VOC*	234.64	252.66	+ 18.02

*VOC TAP Speciation (TPY) LAC 33:III.Chapter 51 Regulated VOC TAPs			
Pollutant	**Before**	**After**	**Change**
Benzene	33.95	33.95	0.00
Cumene	0.63	0.63	0.00
Ethyl benzene	39.57	39.57	0.00

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*VOC TAP Speciation (TPY) LAC 33:III.Chapter 51 Regulated VOC TAPs			
Pollutant	**Before**	**After**	**Change**
n-Hexane	0.22	0.22	0.00
Methanol	0.02	0.02	0.00
Styrene	92.44	92.44	0.00
Toluene[1]	11.98	11.98	0.00
Xylene[1]	5.21	5.21	0.00
Total VOC TAPs	**184.02**	**184.02**	0.00

Non-TAP VOC Speciation (TPY)			
Pollutant	**Before**	**After**	**Change**
Ethylene[1] (Non-TAP VOC)	2.21	2.21	0.00

Pollutant	**Before**	**After**	**Change**
Other VOC (not including Ethylene)	48.41	66.43	+ 18.02

[1] Highly Reactive Volatile Organic Compound (HRVOC)

Non-VOC TAP Speciation (TPY) LAC 33:III.Chapter 51 Regulated Non-VOC TAPS			
Pollutant	**Before**	**After**	**Change**
Ammonia	9.43	17.22	+ 7.79
Chlorine	0.34	0.34	0.00
Total Non-VOC TAPs	**9.77**	**17.56**	**+ 7.79**

Air Modeling Analysis

For modeling analysis, refer to Section VII of the draft Part 70 permit.

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to Section VIII of the draft Part 70 permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to Section IX of the draft Part 70 permit.

IV. Regulatory Analysis

The applicability of the appropriate regulations is straightforward and provided in the Facility Specific Requirements Section of the draft permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms conditions and standards are provided in the Facility Specific Requirements Section of the draft permit.

Prevention of Significant Deterioration (PSD) Applicability/Nonattainment New Source Review (NNSR)

There are no modifications or increases in air emissions proposed in this minor modification permit that trigger PSD regulations or NNSR.

Maximum Achievable Control Technology (MACT) Requirements

The Cos-Mar Styrene Monomer Plant is a major source of LAC 33:III.Chapter 51-regulated toxic air pollutants (TAP). Compliance Plan No. 92025 was approved November 16, 1994. Emissions of benzene, a Class I TAP, and ethyl benzene and styrene, Class II TAPs, are above their respective minimum emission rates (MER) established in LAC 33:III.5112; thus, sources of these compounds require maximum achievable control technology (MACT). Emissions of ammonia, chlorine, and toluene are also above their respective MERs; however, they are Class III TAPs and MACT is not required. The impact of all TAP emissions must be below their respective Ambient Air Standards. Emissions modeling indicates compliance of the Louisiana Toxic Air Pollutant Ambient Air Standards outside of industrial properties.

Emissions of cumene, n-hexane, methanol, and xylene are below their respective MERs.

40 CFR 64-Compliance Assurance Monitoring (CAM) Rule

Compliance Assurance Monitoring (CAM) is applicable to the facility; however, CAM does not apply to the Cos-Mar Styrene Monomer Plant due to the following:

1. Sources do not have potential pre-control device emissions that are equal to or greater than 100% of the amount, in TPY, required for the source to be classified as a major source (100 TPY).
2. Sources do not use control devices to achieve compliance with an emission limitation or standard.
3. Part 64 does not apply to emission limitations or standards for which the Part 70 permit specifies a continuous compliance demonstration method.

V. Permit Shield

TOTAL is in compliance with all applicable state and federal air quality regulations. A permit shield is not required.

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VI. Periodic Monitoring

The Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the proposed permit.

VII. Applicability and Exemptions of Selected Subject Items

See Permit.

VIII. Streamlined Requirements

Unit or Plant Site	Programs Being Streamlined	Stream Applicability (by weight)	Overall Most Stringent Program
Cos-Mar Styrene Monomer Plant	40 CFR 63 Subpart H	5% OHAP	40 CFR 63 Subpart H*
	LAC 33:III.Chapter 51	5% Class I & II TAP	
	LAC 33:III.2122	10% VOC	
	40 CFR 61 Subpart V	10% VHAP (Benzene)	
	40 CFR 61 Subpart J	10% Benzene	
	40 CFR 60 Subpart VV	10% VOC	

*Process drains shall be monitored per LAC 33:III.2122.

IX. Glossary

Best Available Control Technologies (BACT) - An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under this part which would be emitted from any proposed major stationary source or major modification which the administrative authority, on a case-by-

case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

Carbon Monoxide (CO) – A colorless, odorless gas which is an oxide of carbon.

Grandfathered Status - Those facilities that were under actual construction or operation as of June 19, 1969, the signature date of the original Clean Air Act. These facilities are not required to obtain a permit. Facilities that are subject to Part 70 (Title V) requirements lose grandfathered status and must apply for a permit.

Maximum Achievable Control Technology (MACT) - The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

New Source Review (NSR) - A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_x) - Compounds whose molecules consists of nitrogen and oxygen.

Nonattainment New Source Review (NNSR) - A New Source Review permitting program for major sources in geographic areas that do not meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. Nonattainment NSR is designed to ensure that emissions associated with new or modified sources will be regulated with the goal of improving ambient air quality.

Organic Compound - Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit - Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$10 tons per year of any toxic air pollutant; $\geq$25 tons of total toxic air pollutants; and $\geq$100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10}- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) - The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO_2) – An oxide of sulphur.

Title V permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) - Any organic compound which participates in atmospheric photochemical reactions; that is, any organic compound other than those which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.